Dependable Products From People You Trust

Roller Oven With Programmable Timer and Circulating Fan, 4 Roller

172-00-C (115 Volt)
172-00-1-C (230 Volt)

Instruction Manual

Updated 01/13/2015
Ver. 3.0

OFI Testing Equipment, Inc.
11302 Steeplecrest Dr. · Houston, Texas · 77065 · U.S.A.
Tele: 832.320.7300 · Fax: 713.880.9886 · www.ofite.com
©Copyright OFITE 2015

Table of Contents

Introduction **2**

Specifications **3**

Components **4**

Safety **6**

Roller Ovens *6*

Aging Cells *6*

Quick Start **7**

Setup **9**

Operation **10**

Timer **12**

Maintenance **15**

Appendix **18**

Temperature Units *18*

Warranty and Return Policy **19**

Introduction

The OFITE Roller Oven (U.S. Patent No. 4,677,843) is an effective aid in determining the effects of temperature and pressure on drilling fluid as it circulates through the well bore. Aging the drilling fluid in pressurized containers effectively demonstrates the thermal effects on drilling fluids in which a base exchange reaction occurs and in determining the stability of mud additives and emulsified fluids such as oil muds. Aging is done under conditions that vary from static to dynamic and from ambient to highly elevated temperatures.

Many mud constituents degrade slowly at high temperatures. Such degradation occurs while circulating, but it is more severe when the mud is left in the lower part of the hole when making a trip. When running laboratory tests, aging temperatures are often selected to be near the anticipated circulating or bottom-hole temperatures and pressures, and aging cells are typically rolled in an oven for at least 16 hours.
Routine laboratory analysis using roller ovens would include:

a. Simulate chemical reactions taking place in freshly prepared muds.
b. Determine the time it takes reactions to reach equilibrium under temperature and pressure.
c. Determine the Viscosity of the fluid prior to aging and after.
d. Determine filtration control properties prior to aging and after.
e. Determine the stability of drilling fluid additives and drilling fluids such as oil muds.
f. Perform corrosion analysis.

The 4-roller oven can hold six 260-mL Aging Cells or three 500-mL Aging Cells, while the 5-roller oven can hold twelve 260-mL Aging Cells or eight 500-mL Aging Cells. These are both ideal for laboratory use. OFITE rollers are variable-speed controlled and constructed of stainless steel for longer life and a cleaner environment inside the oven. Glass-impregnated Teflon® roller bearings extend the life of the rollers and allow for longer maintenance-free service.

All models feature a digital temperature controller that can be read directly from outside the oven. The temperature is controlled by an electronic solid-state thermostat and operates between 100°F and 450°F (38°C - 232.2°C). The 4 and 5-roller ovens include a seven-day programmable timer as standard equipment. The timer may be preset to automatically start and stop the heaters, allowing unattended operation. A circulating fan is included on all models which greatly improves air circulation within the oven providing more stable, consistent, and reliable uniform heating.

The Redundant Heat Control is available on select models and is a safety feature for the heaters in the event one or more over-heat. Power to the heaters will be shut down if the oven temperature exceeds a set maximum temperature. The aging process due to the length of time required for completion of the test, is seldom monitored, so a heater failure may be serious.

Specifications

The OFITE Roller Ovens are designed to provide heating and rolling functionality simultaneously or independently. Therefore, they can be put to many practical uses, for instance:

1. Heating Mode Only:
   - Drying Oven
   - Aging Oven
   - Baking Oven

2. Rolling Mode Only:
   - Ball Mill Roller
   - To make homogenous mixtures of liquids
   - To make homogenous mixtures of powders
   - To agitate chemicals into solutions
   - To de-aerate liquids

All OFITE Roller Ovens conform to the American Petroleum Institute's (API) Recommended Practice (RP) 13I. The oven is capable of maintaining a temperature of 150° F ± 5° F (65° C ± 3° C) as specified in RP 13I.

- Temperature Range: 100 - 450°F (38 - 232.2°C)
- Digital Temperature Controller
- 25-RPM Motor
- Programmable Timer
- Material:
  - Cabinet: 303 Stainless Steel
  - Rollers: 304 Stainless Steel

4-Roller Oven:
- 350-Watt Heater, Qty: 2
- Capacity:
  - 260 mL Aging Cells: 6
  - 500 mL Aging Cells: 3
- Size: 26.75" × 22" × 26" (70 × 55.9 × 66 cm)
- Weight: 141 lb. (64 kg)
- Crated Size: 35" × 29" × 36" (89 × 84 × 91 cm)
- Crated Weight: 239 lb. (108.4 kg)

Components

All Ovens:

#165-14-8	Type “J” Thermocouple, ⅛" × 6"
#165-14-10	Fuse, 1 Amp, Qty: 5
#165-45	Neon Lamp, Red
#165-45-1	Neon Lamp, Clear
#170-05	Thermostat, 50° - 500°F (10° - 260°C)
#172-01	Fuse, ½ Amp, for Temperature Controller, Box of 5
#172-02-2	Chain, 2 Feet
#172-02-4	Chain, 1 Foot
#172-03	Sprocket, ½" Bore, Qty: 7
#172-04	Connecting Link for Chain, Qty: 3
#172-08	Bearing for Roller Shafts, Qty: 8
#172-09	Fuse, 10 Amp, Box of 5
#172-11-1	Temperature Controller
#172-13	Fuse, Light Holder
#172-14	On/Off Toggle Switch
#172-15-1	Omron Programmable Timer
#172-22	Heater, 350 Watt, Qty: 2
#172-24	Solid State Relay, 240V-25A
#172-25	Fan Motor
#173-15	Knob, Oven Door, Black
#174-07-1	5" Fan Blade
#174-13	Motor
#174-14	Motor Controller

115-Volt Ovens (172-00-C):

#171-82	Power Cord, 8 Feet
#172-07	Fuse, 5 Amp, Box of 5

230-Volt Ovens (172-00-1-C):

#130-74	Transformer, 230/115 Volt, 50/60 Hz
#165-40-2	Power Cable, 6 Feet
#172-05	Fuse, 2 Amp, Box of 5

Optional:

175-25 Aging Cell, 303 Stainless Steel, with Valve, 260 mL
175-30 Aging Cell, 303 Stainless Steel, with Valve, 500 mL
175-50 Aging Cell, 316 Stainless Steel, with Valve, 500 mL
175-80 Aging Cell, 316 Stainless Steel, with Valve, 1,000 mL

#172-00-SP Spare parts for #172-00-C, 4-Roller Oven with Circulation Fan, 115 Volts

Part Number	Description	Quantity
#165-45	Neon Lamp, Red	1
#165-45-1	Neon Lamp, Clear	1
#172-01	Fuse for Temperature Controller, ½ Amp	5
#172-03	Sprocket	6
#172-04	Connecting Link for Chain	6
#172-06	Half Link for Chain	6
#172-07	Fuse, 5-Amp	5
#172-08	Bearing, for Roller Shafts, Glass-Impregnated Teflon®	8
#172-09	Fuse, 10-Amp	5
#172-13	Fuse Light Holder	1
#172-22	Heater, 350-Watt	2

Note

Spare parts listings are intended to be used as a reference for future purchases. Everyone's consumable requirements will be different, and replacement quantities needed will depend upon the number of test performed on a daily and/or weekly basis.

#172-00-1-SP Spare parts for #172-00-1-C, 4-Roller Oven with Circulation Fan, 230 Volts

Part Number	Description	Quantity
#165-45	Neon Lamp, Red	1
#165-45-1	Neon Lamp, Clear	1
#172-01	Fuse for Temperature Controller, ½ Amp	5
#172-03	Sprocket	6
#172-04	Connecting Link for Chain	6
#172-05	Fuse, 2 Amp	5
#172-06	Half Link for Chain	6
#172-08	Bearing, for Roller Shafts, Glass-Impregnated Teflon®	8
#172-09	Fuse, 10-Amp	5
#172-13	Fuse Light Holder	2
#172-22	Heater, 350-Watt	1

Note

Spare parts listings are intended to be used as a reference for future purchases. Everyone's consumable requirements will be different, and replacement quantities needed will depend upon the number of test performed on a daily and/or weekly basis.

Safety

Roller Ovens

Always wear heat resistant gloves and other suitable protection whenever working with hot roller ovens and Aging Cells.

a. Installing Aging Cells inside a hot oven.
b. Removing Aging Cells from a hot oven.

Always wear eye protection when working with Roller Ovens. Be careful to not open a hot oven with your face directly in front of the newly opened door.

During operation the outside of the Roller Oven can get very hot, especially the door area, and may cause burns if carelessly touched by unwary personnel.

The circulating fan inside the oven can be very dangerous if adding or removing Aging Cells when the blades are turning. To prevent injury always turn the “Heat” switch on the Control Panel “Off” when loading or unloading cells.

OFITE ships all Roller Ovens with a covered back to protect against getting clothing caught in the rotating chains and sprockets. This cover should remain in place at all times except when working on the chains or sprockets. For ovens where the rear cover is missing or has been misplaced, then the back of the oven should face closely to a wall.

Disconnect all power cords when performing maintenance or replacing a fuse.

Be careful when working around the latch on the door, especially the knob and latch. Fingers can get caught in the latch resulting in a painful injury.

The corners of the oven may cause injury if impacted directly. Be especially careful when working around the top stainless steel motor housing as sharp corners may cause cuts during cleaning.

Ovens should always be used in a ground circuit.

Make sure the electrical source has at least 8 Amps of capacity.

Safety

Aging Cells

Aging Cells can be very dangerous if handled improperly. Elevated temperature and pressure within the cell can cause the contents to be released with explosive force.

Always allow the cell to cool to ambient temperature before opening.

Always point the cell away from people and equipment when depressurizing by opening the valve stems.

Do not overfill the cell. Refer to the instruction manual for Aging Cells #175-25, #175-30, #175-50 to determine the appropriate fluid volume for the test conditions.

Periodically check the inside of Aging Cells for stress or pit corrosion. Operating cells in high or low pH concentrations or with concentrated saline solutions (Chlorides) will promote corrosion.

Quick Start

1. Plug in to appropriate electrical outlet.

2. Flip the “Heat” switch on the control panel ON. The red light pulsates when temperature is reached. This also turns on the circulating fan.

3. Flip the “Motor” switch on the control panel ON. The white light comes on and the rollers begin turning.

Programmable Timer

To set the correct local time:

1. Turn the “Heat” switch on the control panel to the ON position.

2. Set the “Out 1 switch - On-Auto-Off” to the AUTO (middle) position.

3. Set the “P1, P2, Run” button to P1 to activate programming mode for Output 1.

4. Open the panel door and press and hold the “TIME ADJ” button until a blinking clock appears.

5. Press the “h” and “min” buttons to set the correct local time.

6. Press “WRITE” when finished.

7. Set the “P1, P2, Run” button to P1 to show the time.

To program the timer:

1. Turn the “Heat” switch on the control panel to the ON position.

2. Set the “OUT1” switch - On-Auto-Off” to AUTO setting. Leave the “OUT2” switch off.

3. Set the switch to the right of the display to P1 to activate programming mode for Output 1.

4. Select the day of the week for each the ON/off operation, marked by the removal of a dash above the day of the week button.

5. Press the “h” and “min” buttons to set the correct time for the “ON” or beginning cycle to begin. The “UP” arrow will blink.

6. Press “Write” to activate the Turn Off time (The Down Arrow Blinks).

7. Select the day of the week for each the on/OFF operation, marked by the removal of a dash above the day of the week button.

8. Press the “h” and “min” buttons to set the correct time for the “OFF” cycle to end. The “DOWN” arrow will blink.

9. Press “WRITE” when finished.

10. Set the switch (“P1, P2, Run”) to the right of the display to “RUN”. The bar (-) will display the day(s) of operation.

To clear all programmed settings:
Open the bottom panel and insert a pointed object into the “RESET” hole. Then press and hold the “+1h / CLEAR” button for 3 seconds.

Temperature Controller

1. Upper Temperature is the current temperature.

2. Lower Temperature is the temperature set point.

Setup

1. Flip both switches on the control panel (“Motor” and “Heat”) to the “Off” position (down).

2. Connect the power cord to the proper voltage source. If an adapter or another power plug is required, note that the green wire is the ground and the white and black wires are the power leads.

3. When the power cord is connected, the timer will be activated. It is recommended that the power be left connected even when tests are not being conducted so the timer will continue to keep time.

Operation

1. Make sure the oven is connected to a power supply. Refer to page 12 for instructions on operating the timer. To run a test without a timer pro gram, set the “OUT1” switch to “ON” on the timer.

2. To turn on the rollers flip the “Motor” power switch to the “On” position. The white indicator light will come on and the rollers will start turning.

3. To turn on the heaters, flip the “Heat” power switch to the “On” position on the Control Panel. The heaters and the red indicator light will come on. The red indicator light will pulsate on and off as the temperature controller maintains the desired heat. The indicator light will pulsate on and off as the temperature controller maintains the desired heat.

Important

The circulating fan will automatically turn on when the “Heat” switch is on. The fan blades can be dangerous when the fan is on. To prevent injury, always turn the “Heat” switch off when loading and unloading cells.

4. The upper register on the temperature controller will display the current temperature, while the lower register will show the current setpoint. Use the up and down arrow to adjust the temperature setpoint.

   The temperature will rise at approximately 150°F (65.5°C) per hour.

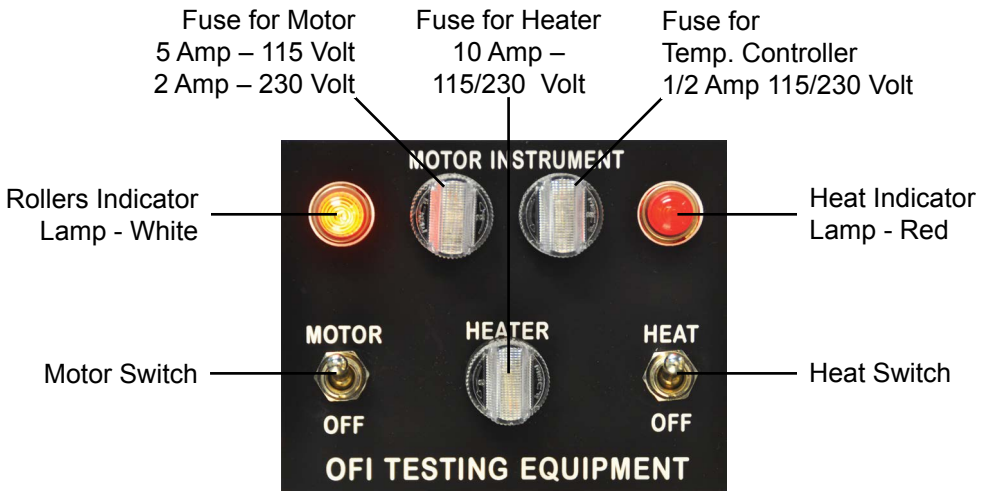
5. The oven can be preheated while the samples are being tested and pre-pared. It is recommended that the samples be placed in the OFITE Aging Cells for the oven tests. However, the cells for the High-Temperature, High-Pressure (HTHP) Filter Press may also be used.

Important

Refer to the Aging Cell instruction manuals to determine the ap-propriate fluid volume for your test conditions. Fluid will expand as temperature increases so expansion space must be allowed.

Important

If the aging cells are going to be rolled during a test, install o-rings on the outer perimeter on the top and bottom of the cells. Failure to do so can damage the rollers in the oven. Teflon (#175-46) and Buna N (#175-54) o-rings are available. For tests above 300°F (148.9°C), use Viton o-rings.



Control Panel

Note

If for some reason the temperature controller fails, the thermostat will cut power to the heater at 450°F (232.2°C), which is the maximum allowable temperature.

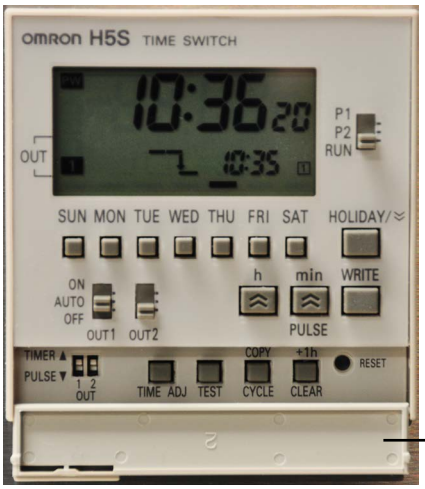
Important

Be careful in handling hot aging cells. Do not open cells while hot or under pressure. Properly bleed off pressure and be sure the valve stem is always pointed away from people or equipment. Always wear personal safety equipment.

6. Leave the “Heat” switch on the control panel ON until the oven and sample have cooled down to handling temperature. The temperature controller will indicate the oven temperature as long as the “Heat” switch is on. For faster cooling, open the door.

7. After the test is complete, turn the “Heat” and “Motor” switches off.

Timer



Panel Door
Folds Down

The timer can be programmed to turn the heaters on and off throughout the week. Each set of on/off operations requires setting an ON time and an OFF time separately. During programming, the following symbol will appear on the display.

When programming the ON time, the up arrow will blink. When programming the OFF time, the down arrow will blink.

To Set to the Correct Time:

1. Turn the “Heat” switch on the control panel to the ON position.
2. Set the “Out 1 switch - On-Auto-Off” to the AUTO (middle) position
3. Set the “P1, P2, Run” button to P1 to activate programming mode for Output 1.
4. Open the panel door and press and hold the “TIME ADJ” button until a blinking clock appears.
5. Press the “h” and “min” buttons to set the correct local time.
6. Press “WRITE” when finished.
7. Set the “P1, P2, Run” button to P1 to show the time.

Programming:

1. Turn the “Heat” switch on the control panel to the ON position.
2. Set the “OUT1” switch - On-Auto-Off” to AUTO setting. Leave the “OUT2” switch off.
3. Set the switch to the right of the display to P1 to activate programming mode for Output 1.
4. Select the day of the week for each the ON/off operation, marked by the removal of a dash above the day of the week button.
5. Press the “h” and “min” buttons to set the correct time for the “ON” or beginning cycle to begin. The “UP” arrow will blink.
6. Press “WRITE” to activate the turn off time (The down arrow blinks).
7. Select the day of the week for each the on/ OFF operation, marked by the removal of a dash above the day of the week button.
8. Press the “h” and “min” buttons to set the correct time for the “OFF” cycle to end. The “DOWN” arrow will blink.
9. Press “WRITE” when finished.
10. Set the switch (“P1, P2, Run”) to the right of the display to “RUN”. The bar (-) will display the day(s) of operation.

To clear All programmed settings:

1. Open the bottom panel and Insert a pointed object into the “RESET” hole.

2. Then press and hold the “+1h / CLEAR” button for 3 seconds.

Note

Precautions:

1. The Timer is not waterproof or oil resistant. Keep liquids away from the surface of the display.

2. Do not use organic solvents such as paint thinner or Benzene, strong Alkaline or strong acids as cleaners as they will damage the external finish.

3. None of the timer components are user-replaceable, including the battery which backs up the clock and setup functions.

4. Supply voltage range: 100 to 240 VAC, 50 / 60 Hz. Internal elements may be destroyed if a voltage outside the range is applied.

5. Only one of the two channels are utilized.

6. Season switching, cyclic operation, and non-operating day (Holiday) settings are non-functional as the timer may be programmed daily for such functions.

Maintenance

1. Every 90 days, put a small amount of grease on the chain and sprockets.

2. Do not lubricate the Teflon® roller bearings.

3. Your OFITE Roller Oven has been preset at the factory to operate at either 115V (172-00 / 173-00) or 230V (172-00-1 / 173-00-1). However, this product is designed to be easily converted from 115V to 230V or from 230V to 115V. To accomplish this:

Important

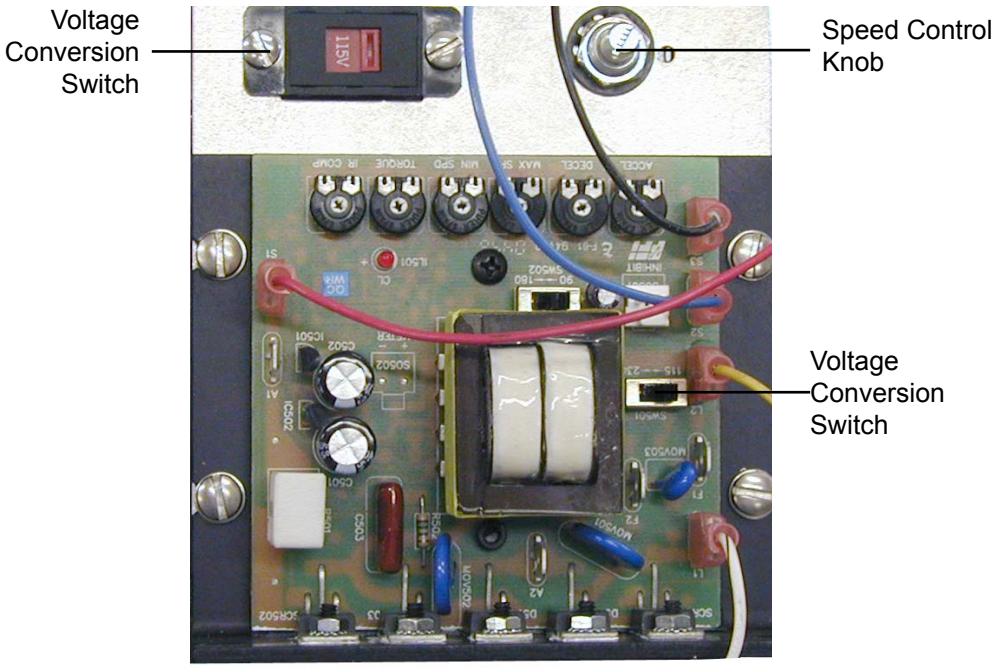
Disconnect the unit from the power source before opening the unit casing.

   a. Remove the top panel.

   b. Remove the existing plug receptacle and replace it with the new one. For 115V, use part #165-47. For 230V, use part #164-30.

   c. Locate the two voltage conversion switches on the circuit board (refer to the photo below). Switch both of these switches to the appropriate voltage (switch them both to the right for 115V and to the left for 230V).

   d. Re-install the top panel.



4. The oven motor speed is preset to 25 RPM. To change the speed:

   a. Open the unit casing as described above and turn the speed control knob (clockwise to increase, counterclockwise to decrease).

   b. Mark one of the rollers. Point a handheld tachometer at the marked roller.

   c. Turn the speed control knob until the desired speed is reached.

5. OFITE Roller Ovens are fused to protect the driving motor, heaters, fan, and the controller. The light in the fuse holder will glow when the fuse burns out. The fuse holders are located above the motor and heat switches on the control panel.

   a. The one on the left is for the motor (5 amps for 115 Volt or 2 Amps for 230 volt).

   b. The one on the right is for the temperature controller (½ Amp).

   c. The one below is for the heater (10 Amps).

   d. The circulation fan motor fuse is inside the oven (1 Amp).

6. Most of the heat is lost around the door. The door insulation material should be soft and pliable. Over time it will become rigid and hard and will not insulate as well. If this happens, replace the insulation (#172-10).

7. Occasionally check the chains and sprockets in the back of the oven. The chain will stretch and the sprocket spokes may become worn down. This affects the operation of the oven requiring an occasional replacement of the chain and sprockets. Every three months, apply a small amount of grease to the chains and sprockets.

Note

The cover on the back of the oven will need to be removed. Always replace it after the necessary repairs have been completed.

Roller Oven – Rear
With Back Panel in Place

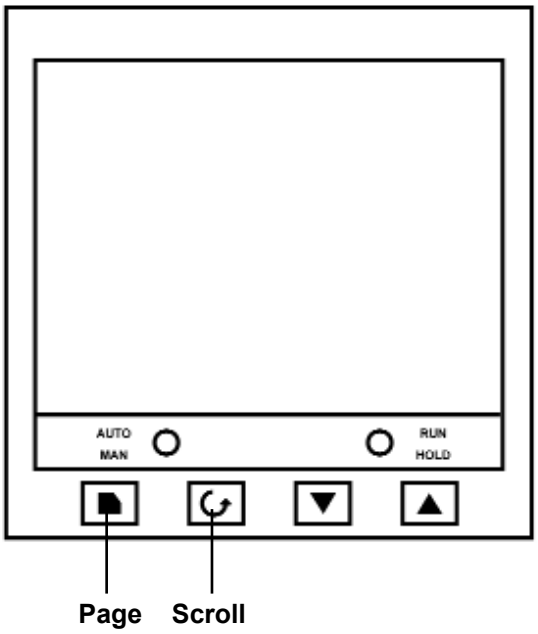
Chain Drive and Sprockets

Appendix

Temperature Units

Use the following procedure to change the units on the temperature controller.

1. Press the page key until the display reads “ACCS / list”.
2. Press the scroll key once. The display should read “codE / 0”.
3. Press the up arrow to change the code to 1. After a few seconds, the display will read “codeE / PASS”.
4. Press the scroll key once. The display will read “Goto / OPEr”.
5. Press the down arrow once. The display will read “Goto / conF”.
6. Press the scroll key once. The display will read “ConF / 0”.
7. Press the up arrow twice. The display will read “ConF / 2”. After a few seconds, the display will read “ConF / PASS”.
8. Press the scroll key twice. The display will read “unit / oF”.
9. Press the up or down arrow to select units. Available options: °F, °C, °K, none.
10. Press the page and scroll keys at the same time. The display will read “Elit / no”.
11. Press the up arrow key once. The display will read “Elit / yes”. This will reboot the temperature controller. After the reboot, the display will show the new units.



Warranty and Return Policy

Warranty:

OFI Testing Equipment, Inc. (OFITE) warrants that the products shall be free from liens and defects in title, and shall conform in all respects to the terms of the sales order and the specifications applicable to the products. All products shall be furnished subject to OFITE's standard manufacturing variations and practices. Unless the warranty period is otherwise extended in writing, the following warranty shall apply: if, at any time prior to twelve (12) months from the date of invoice, the products, or any part thereof, do not conform to these warranties or to the specifications applicable thereto, and OFITE is so notified in writing upon discovery, OFITE shall promptly repair or replace the defective products. Notwithstanding the foregoing, OFITE's warranty obligations shall not extend to any use by the buyer of the products in conditions more severe than OFITE's recommendations, nor to any defects which were visually observable by the buyer but which are not promptly brought to OFITE's attention.

In the event that the buyer has purchased installation and commissioning services on applicable products, the above warranty shall extend for an additional period of twelve (12) months from the date of the original warranty expiration for such products.

In the event that OFITE is requested to provide customized research and development for the buyer, OFITE shall use its best efforts but makes no guarantees to the buyer that any products will be provided.

OFITE makes no other warranties or guarantees to the buyer, either express or implied, and the warranties provided in this clause shall be exclusive of any other warranties including ANY IMPLIED OR STATUTORY WARRANTIES OF FITNESS FOR PURPOSE, MERCHANTABILITY, AND OTHER STATUTORY REMEDIES WHICH ARE WAIVED.

This limited warranty does not cover any losses or damages that occur as a result of:

- Improper installation or maintenance of the products
- Misuse
- Neglect
- Adjustment by non-authorized sources
- Improper environment
- Excessive or inadequate heating or air conditioning or electrical power failures, surges, or other irregularities
- Equipment, products, or material not manufactured by OFITE
- Firmware or hardware that have been modified or altered by a third party
- Consumable parts (bearings, accessories, etc.)

Returns and Repairs:

Items being returned must be carefully packaged to prevent damage in shipment and insured against possible damage or loss. OFITE will not be responsible for equipment damaged due to insufficient packaging.

Any non-defective items returned to OFITE within ninety (90) days of invoice are subject to a 15% restocking fee. Items returned must be received by OFITE in original condition for it to be accepted. Reagents and special order items will not be accepted for return or refund.

OFITE employs experienced personnel to service and repair equipment manufactured by us, as well as other companies. To help expedite the repair process, please include a repair form with all equipment sent to OFITE for repair. Be sure to include your name, company name, phone number, email address, detailed description of work to be done, purchase order number, and a shipping address for returning the equipment. All repairs performed as "repair as needed" are subject to the ninety (90) day limited warranty. All "Certified Repairs" are subject to the twelve (12) month limited warranty.

Returns and potential warranty repairs require a Return Material Authorization (RMA) number. An RMA form is available from your sales or service representative.

Please ship all equipment (with the RMA number for returns or warranty repairs) to the following address:

OFI Testing Equipment, Inc.
Attn: Repair Department
11302 Steeplecrest Dr.
Houston, TX 77065
USA

OFITE also offers competitive service contracts for repairing and/or maintaining your lab equipment, including equipment from other manufacturers. For more information about our technical support and repair services, please contact techservice@ofite.com.